

MICHIGAN  
STATE HIGHWAY DEPARTMENT  
JOHN C. MACKIE  
STATE HIGHWAY COMMISSIONER

PLANS OF PROPOSED  
BRIDGES  
MICHIGAN PROJECT I 75-4(14) 243  
GRAYLING-INDIAN RIVER ROAD  
GRAYLING TWP.-CRAWFORD CO.

GENERAL NOTES

Except where otherwise indicated on these Plans or in the Proposal and Supplemental Specifications contained therein, all materials and workmanship shall be in accordance with the Michigan State Highway Department's Standard Specifications for Road and Bridge Construction, 1960 Edition.

The design of these structures is based on the Michigan State Highway Department's Specifications for the Design of Highway Bridges, 1958 Edition (M20-S16-44) and alternate Military Loading. Live load plus impact deflection = 1/1000 of span length.

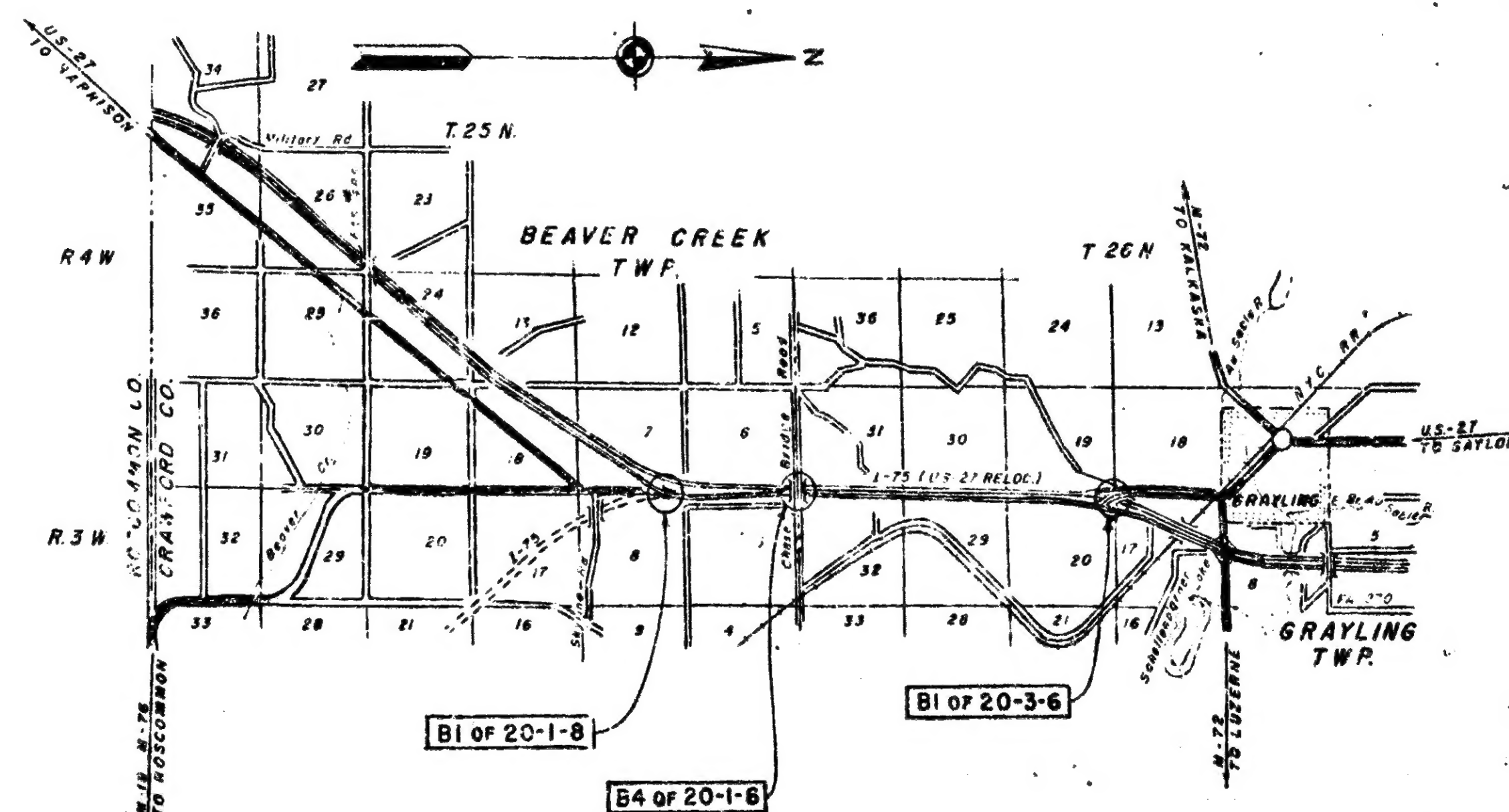
The character of all materials and the extent thereof as shown by borings has been obtained by methods and from sources believed to be reliable. The exactness of this information is, however, in no case guaranteed. Boring data is available in the Design Office at Lansing.

All exposed concrete corners shown square on the Plans shall be beveled with 1/2 inch triangular molder, except as otherwise noted.

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15	ALUMINUM RAILING, BAR CHAIR, BEVEL & MOLDING DETAILS



STANDARD PLANS TO BE PRINTED

SHEET NO.	TITLE
SP2C	STANDARD SLOPE PAVING DETAILS

NOTE  
Where items listed under "Standard Plans" are called for on the plans they are to be constructed according to the Standard Plan over which appears each item, unless otherwise indicated.

STANDARD PLANS NOT TO BE PRINTED

SHEET NO.	TITLE

CONTROL SECTION NO. 20014 RN

CONTRACT FOR	
DIVISION APPROVAL	
CHECKED <i>[Signature]</i>	DATE <i>2-2-40</i>
RECOMMENDED FOR APPROVAL <i>[Signature]</i>	DATE
RECOMMENDED FOR APPROVAL	DATE
OFFICES OF DESIGN & CONSTRUCTION	
APPROVED	DATE
APPROVED	DATE
STATE HIGHWAY DEPARTMENT APPROVAL	
APPROVED	DATE
BY	DATE
PLANS PREPARED BY	
MICHIGAN STATE HIGHWAY DEPARTMENT	DEPARTMENT OF COMMERCE BUREAU OF PUBLIC ROADS
APPROVED	DATE



B.M.\*101 EL. 1259.84  
MSHD. TAG IN W. ROOT OF 8" OAK ,  
70' RT. OF STA. 1039+32 (PROP. NB)

B.M.\*102 EL. 1265.45  
MSHD. TAG IN W. ROOT OF 10" OAK,  
147' RT. OF STA. 1049+20 (PROP. NB)

B.M.\*103 EL. 1261.71  
MSHD TAG IN W. ROOT OF 1" OAK,  
71 ' RT. OF STA. 1059+27 ( PROP. NB)

**Power Line** - There is a 3-Wire Power Line Paralleling  
Exist. NB US 27 NB' to the East,  
North of Chase Bridge Road.  
Owned By R.E.A.

**Power Line** - There is a 3-Wire Power Line Paralleling  
Exist. NB US 27 approx. 280' to the  
West, Owned By Consumers Power Co.

# LOG OF BORINGS

*Bottom of Concrete Abutment A El. 124.95*

**T.H. 5**

Sampled

**1251.25**

**1248.9**

**1245.8**

**EL 1245.3**

**1243.3**

**1233.5**

**1231.3**

**1223.3**

**T.H. 6**

**1251.55**

**1251.1**

**1251.8**

**1247.6**

**1245.8**

**1233.6**

*East of Abutment A El. 1255.55*

Comp. Yell. Sand, Med. Loam Sand, occ. Pebble

Comp. Yell. Sand, Coarse to Medium, occ. Pebble

Comp. Orange Sand, Coarse to Med. occ. Pebble

Comp. Yell. Sand, Coarse to Med. Trace of Pebbles

Comp. Yell. Sand Coarse to Med., occ. Pebble

Comp. Yell. Sand Coarse to Med., occ. Pebble

End of Boring

Comp. Yell. Med. Sand, Loamy

Comp. Yell. Sand, Coarse to Medium, occ. Pebble

Comp. Orange Sand, Coarse to Med. Pebble, Trace Loam

Comp. Orange Sand, Coarse to Med. Pebble

Comp. Yell. Sand Coarse to Med. occ. Pebble

End of Boring

Filled at 10.3 feet - Dry

10.3

10.3

10.3

10.3

12R145		Samples	
12R145	Comp. Yell. Med. Sand, Med. acc. Pebbles, Trace of Loam	12S015	Comp. Yell. Med. Sand Med, acc. Pebble, Traces Loam, Traces Yell Clay
12R146	Comp. Yell. Sand, Coarse to Med. Trace of Pebbles	12S017	Comp. Yell. Sand, Coarse to Med. acc. Pebbles, Traces Yell Clay
12R147	Comp. Yell. Sand, Coarse to Med. acc. Pebbles, Trace Yell. Clay	12S018	Comp. Orange Sand, Coarse to Med. acc. Pebbles, Traces Root & Wood Fibers
12R148	Comp. Orange Sand, Coarse to Med. Pebbles, Trace Yell. Clay	12S019	Comp. Orange Sand, Coarse to Med. acc. Pebble, Traces Loam, Traces of Root & Wood Fibers
12R149	Comp. Orange Sand, Coarse to Med. Pebbles, Trace Yell. Clay	12S020	Comp. Yell. Sand, Coarse to Med. acc. Pebbles
12R150	Comp. Yell. Sand, Coarse to Med. acc. Pebbles	12S021	Comp. Yell. Sand, Coarse to Med. acc. Pebbles
12R151	End of Boring	12S022	End of Boring

Filled at 23 feet - Dry

General Note: Consistence of Soils was determined by inspection of samples and substantiated by soils resistance to caving and jet rod. All samples are washed samples.

Hand-drawn plan view of a bridge structure. The drawing shows a rectangular bridge deck with a central rectangular cutout labeled "12' Curb". The bridge is oriented horizontally. Dimensions are given in feet: the total width is 24'0", the total length is 35'0", and the central cutout is 12'0" wide and 12'0" high. The bridge is supported by two piers, each labeled "12' Curb". The bridge is labeled "Bridge Approach & Culvert" and "Bridge Approach & Culvert". The drawing is dated "1968" and "1968".

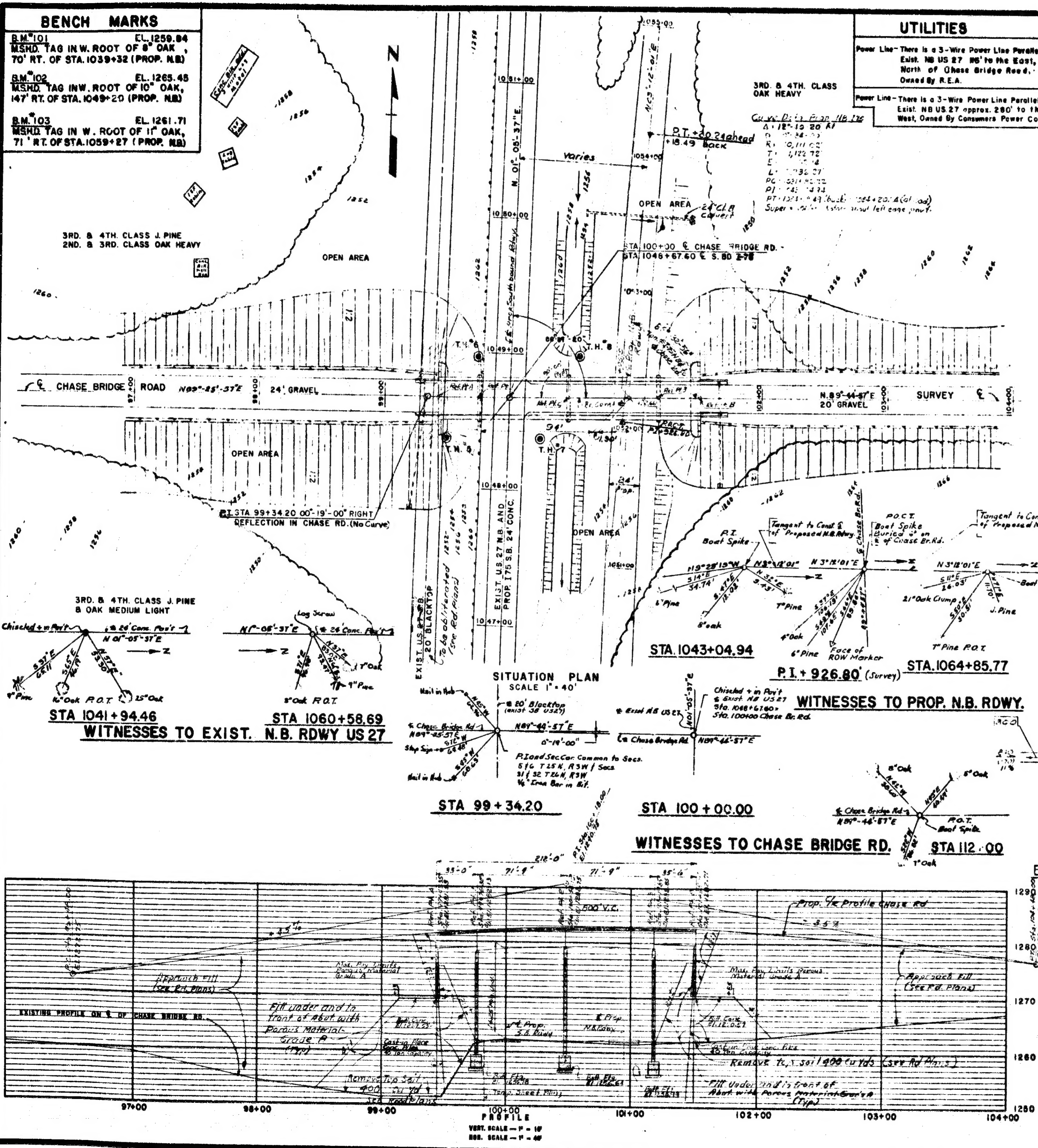
**MICHIGAN STATE HIGHWAY DEPARTMENT**  
CHASE BRIDGE RD. CROSSING I-75 (US 27) 4.0 MI. S. OF GRAYLING

APPROVED	DESIGN SUPERVISING	ENGINEER
APPROVED	ASS'T. ENGINEER	OF DESIGN

*Handwritten:* 8-25-60, 10-55, 11-10-60, 12

**B4 of 20-1-6**

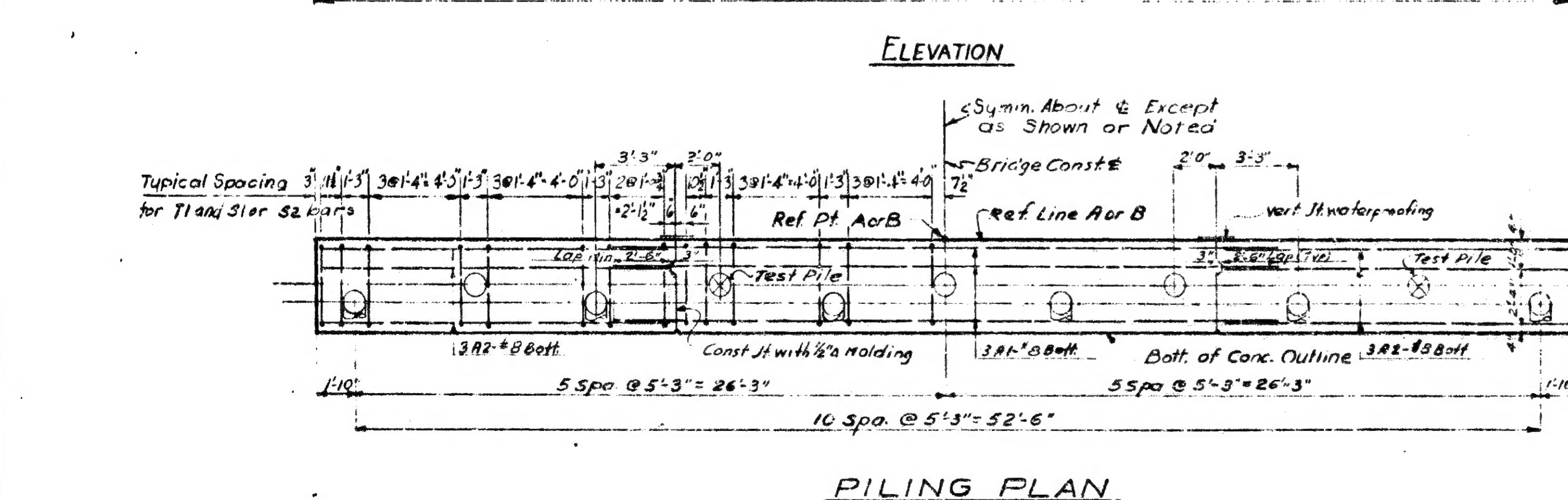
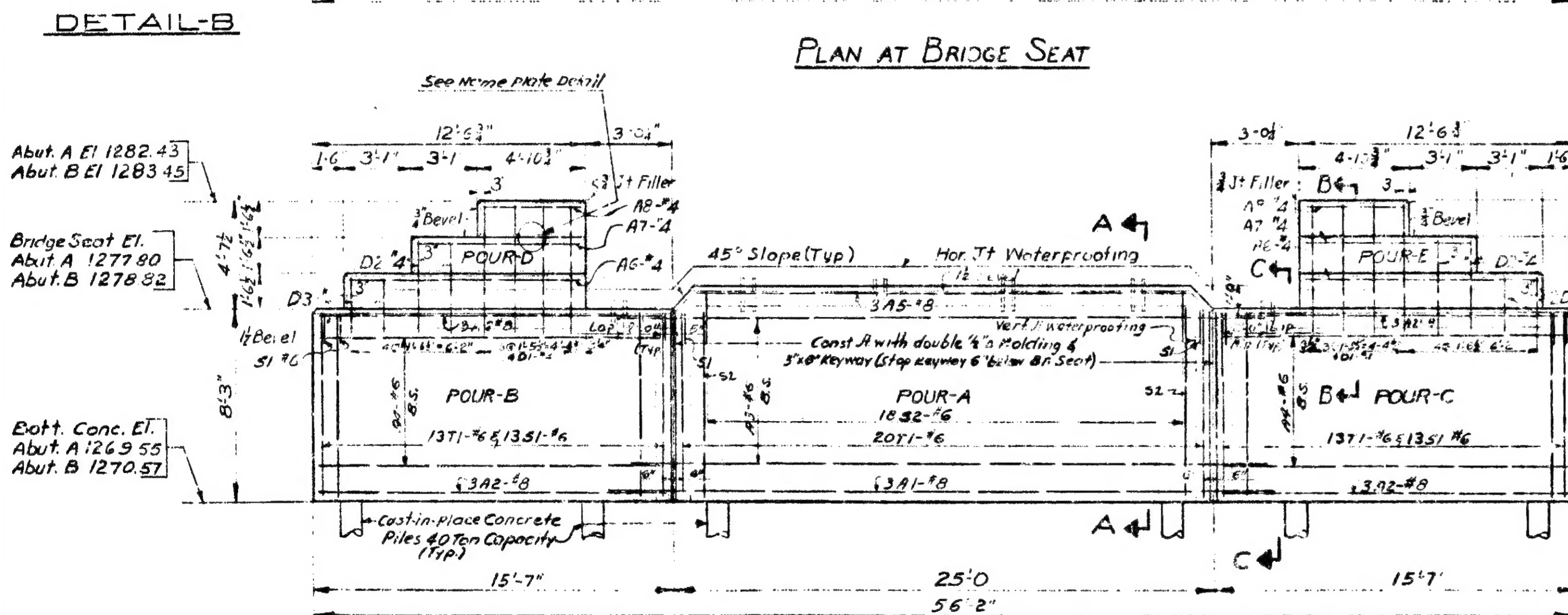
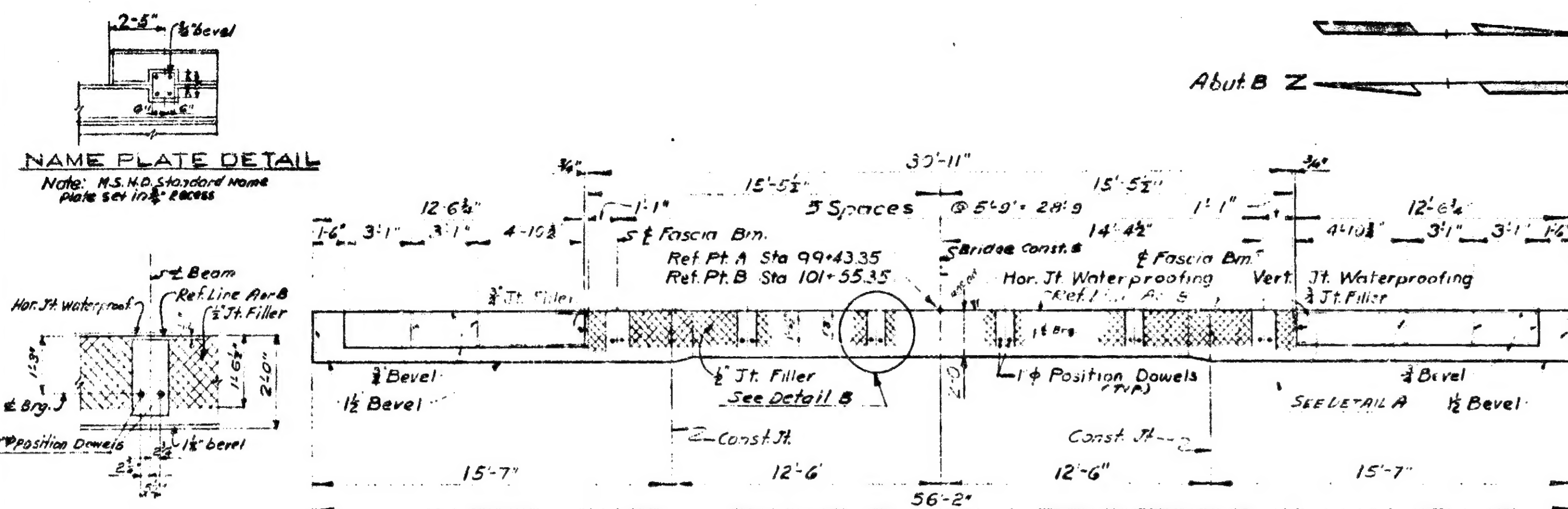
302 of 20214 KM



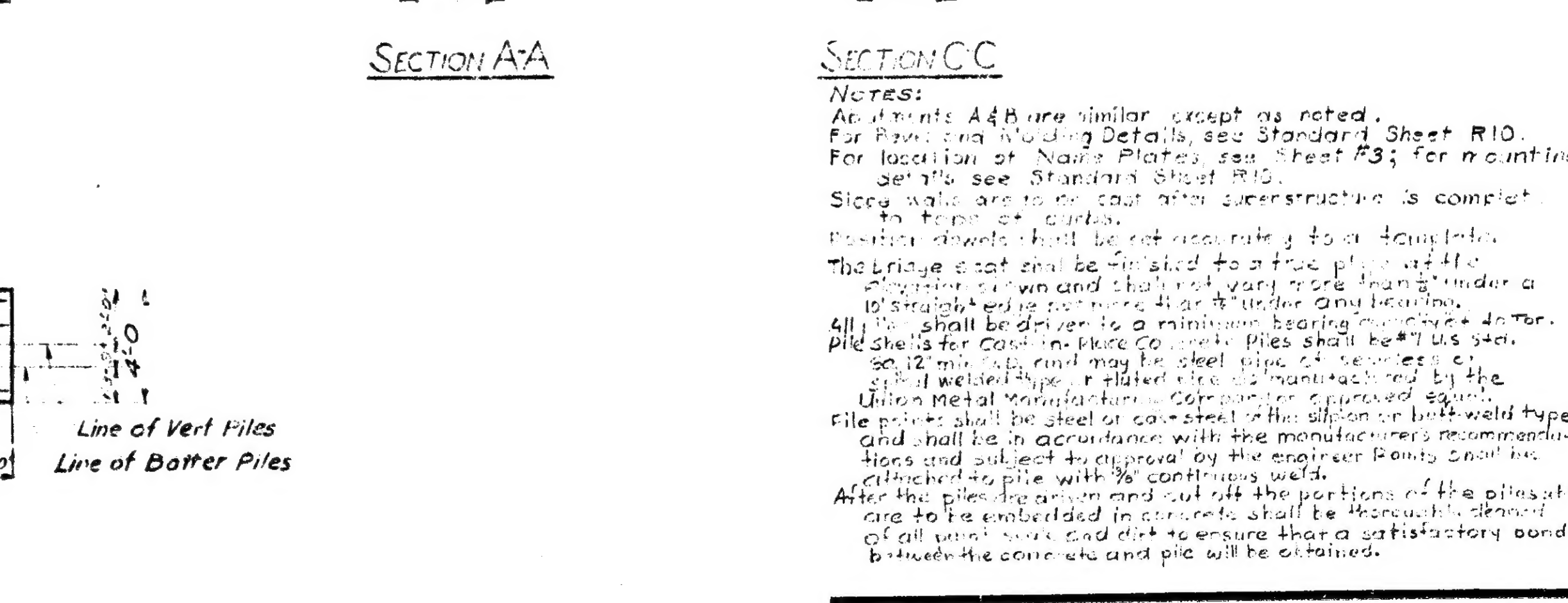
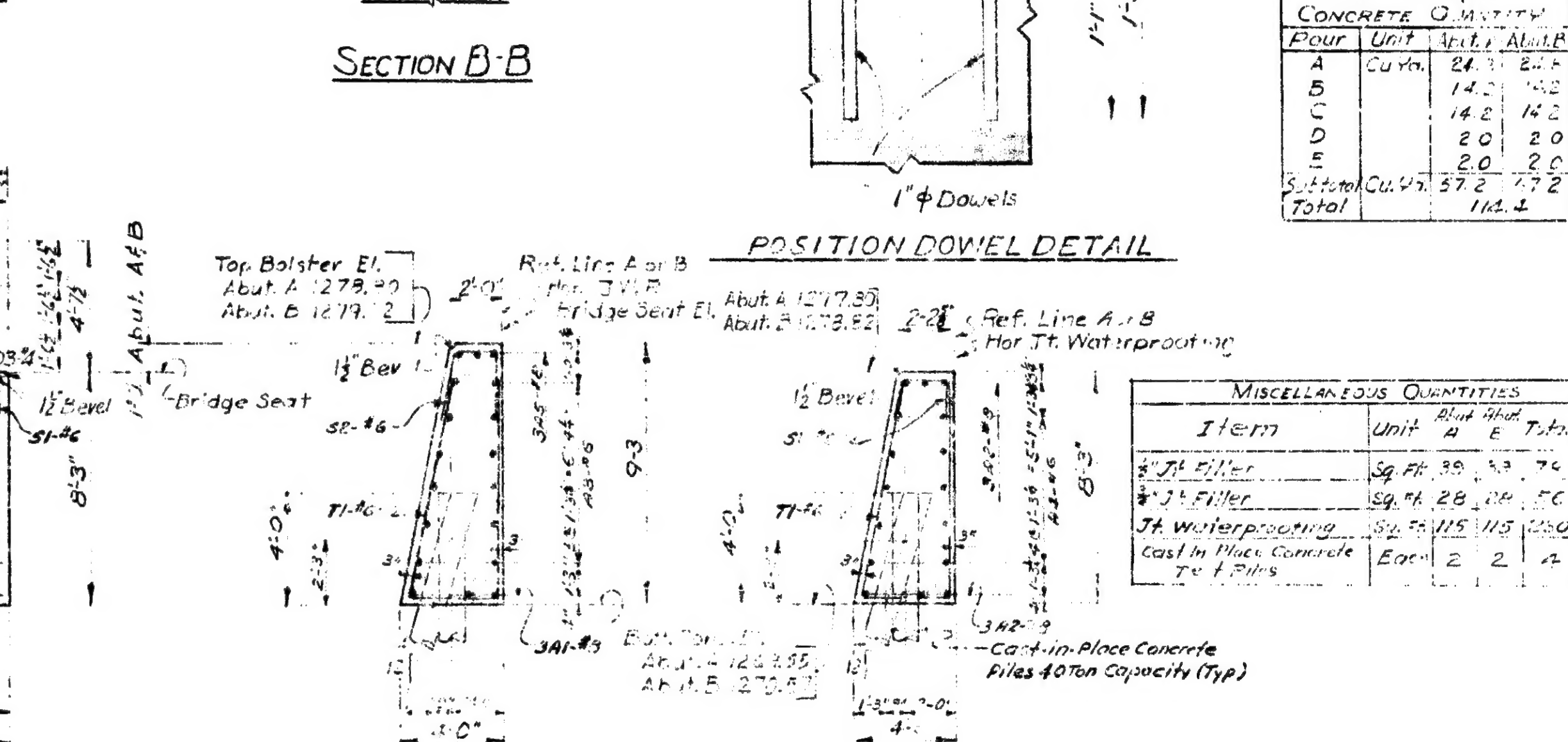
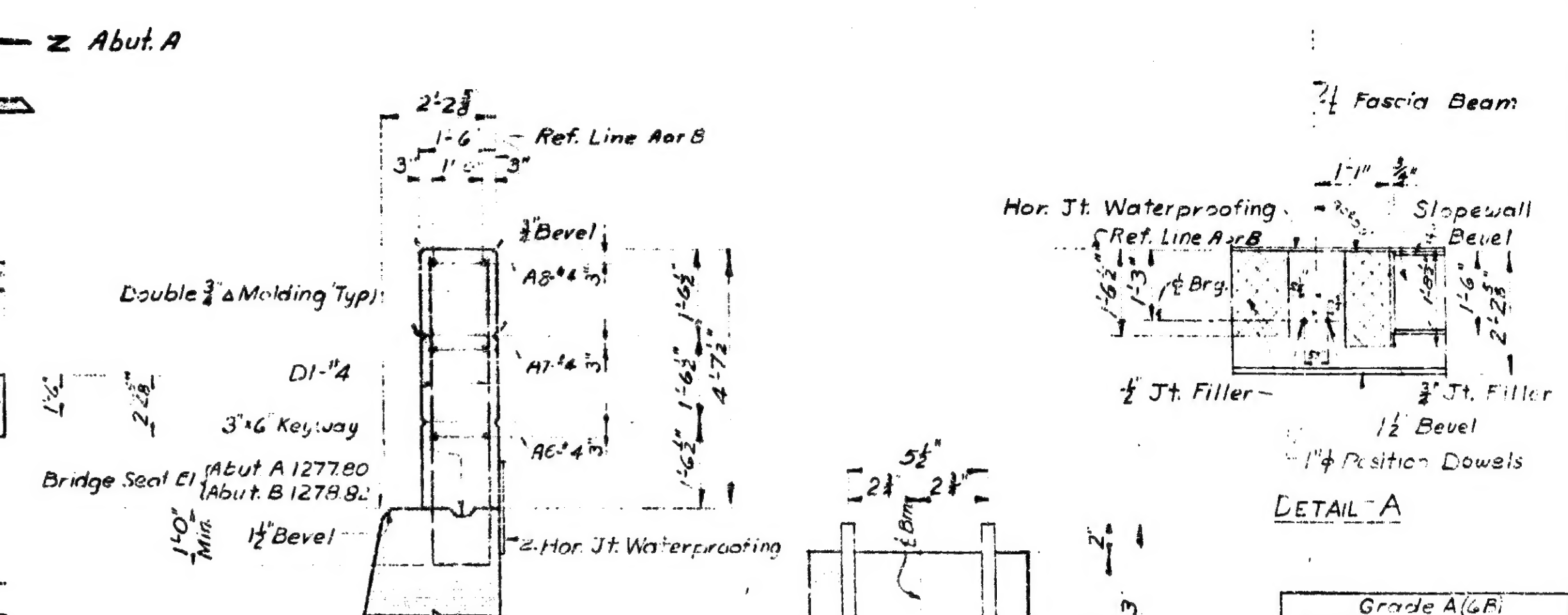








PILE QUANTITIES								
12 Min. O.D. Cast-in-Place Concrete Piles 40 Ton Min. Bearing Capacity								
Location	Number Reg'd	Estimated Length-Limit				No. of Cut-off Each	Cut-off Elev.	
		Furnished Each Total		Driven Each Total				
Abut. A	Vertical	3	30	90	28	24	3	1273.55
	Batter	6	30	180	28	168	6	" "
	Test	2	38	76	28	56	2	" "
Abut. B	Vertical	3	26	78	24	72	3	1274.57
	Batter	6	26	156	24	144	6	" "
	Test	2	34	68	24	48	2	" "
Totals		22	148	648	72	22		



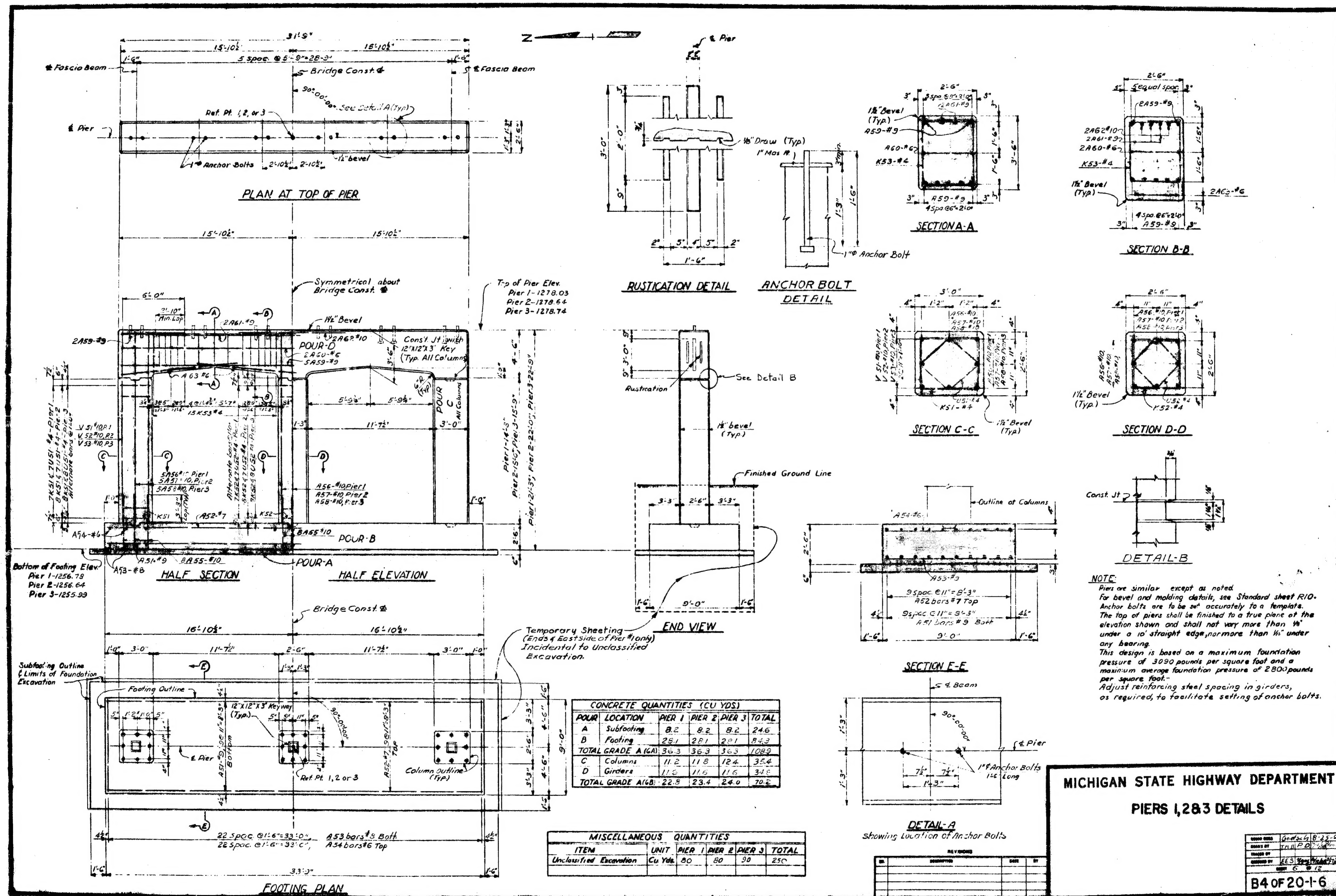
**MICHIGAN STATE HIGHWAY DEPARTMENT**

**ABUTMENT A & B DETAILS**

REVISIONS			
NO.	DESCRIPTION	DATE	BY
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

**B4 OF 20-1-6**





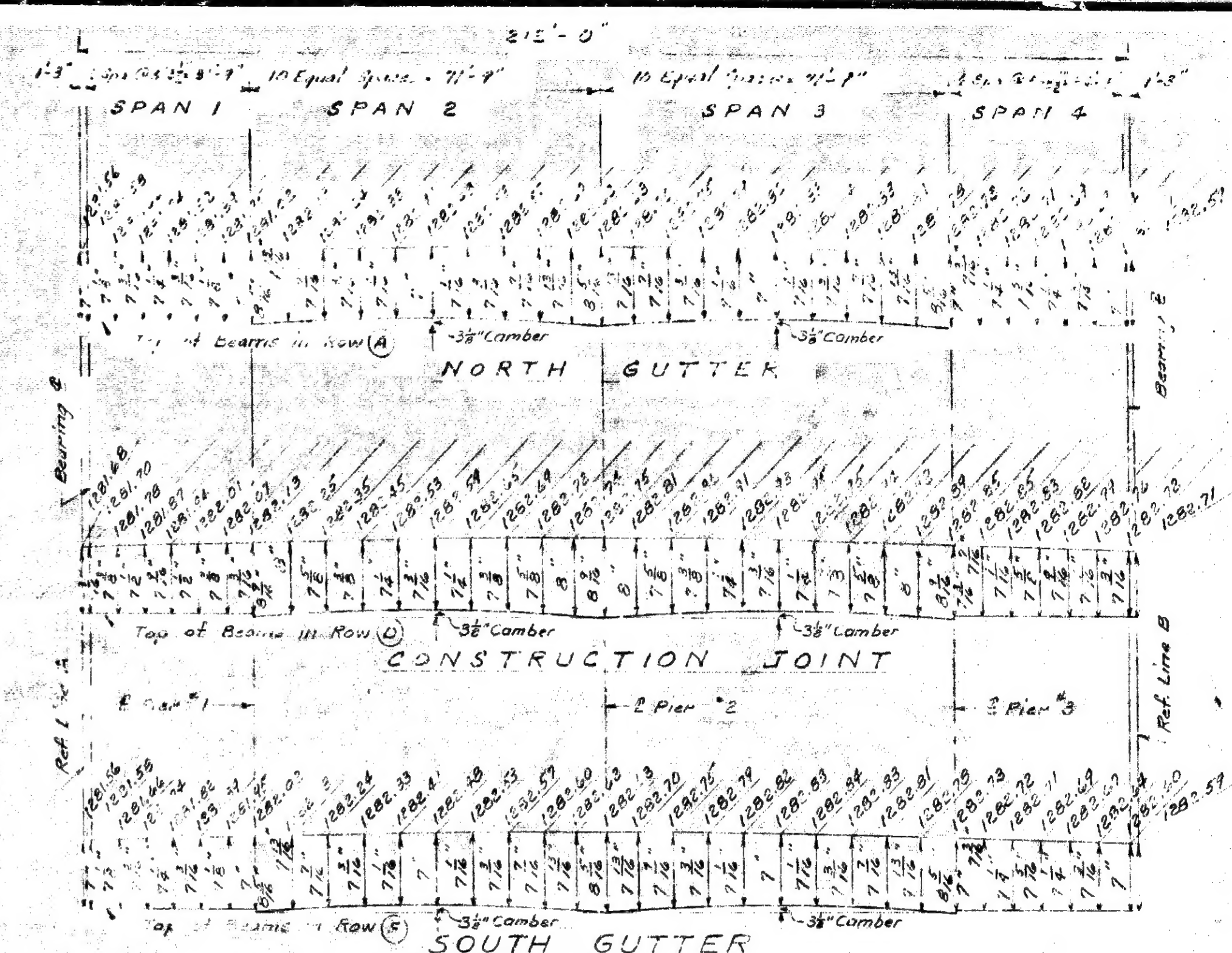
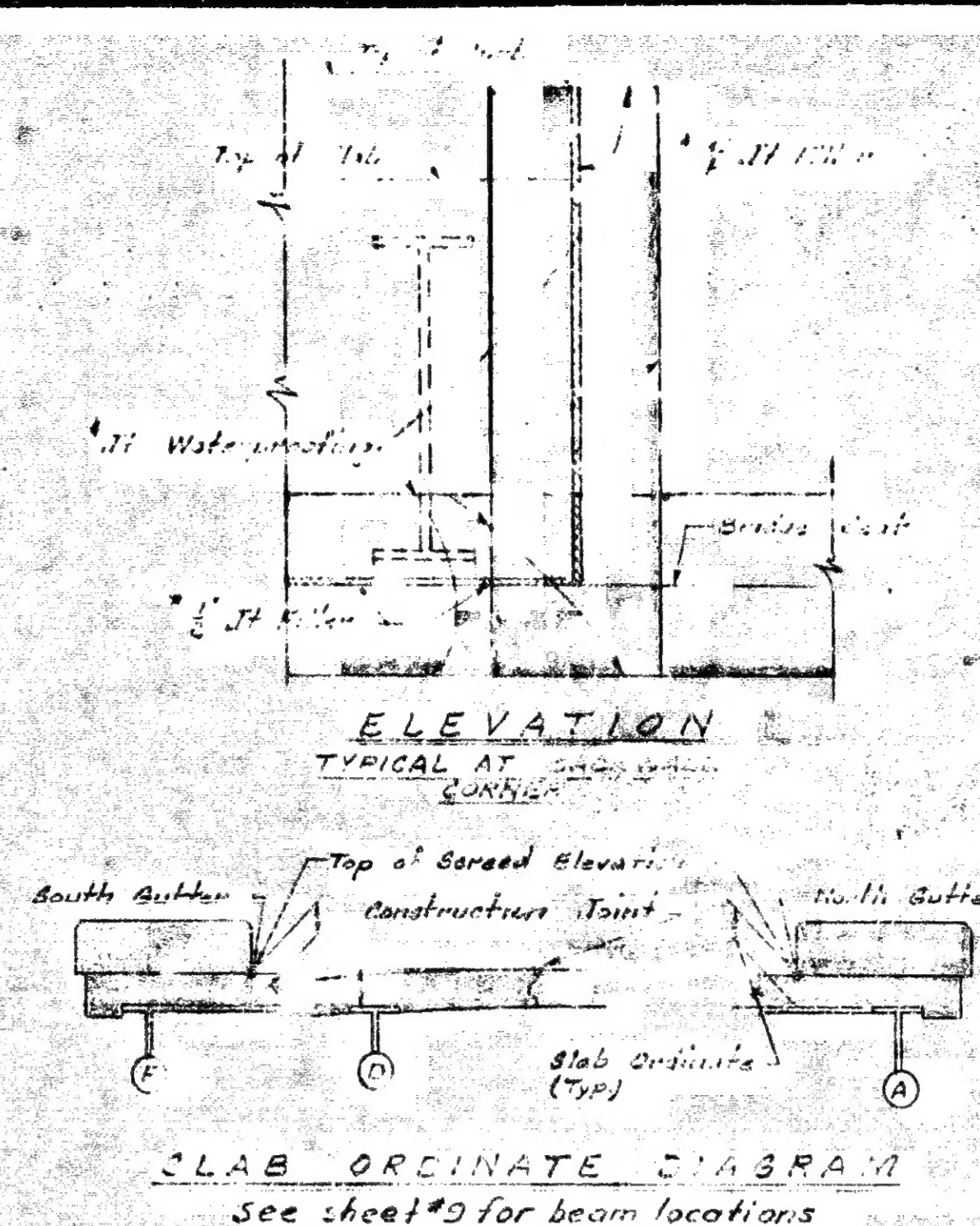
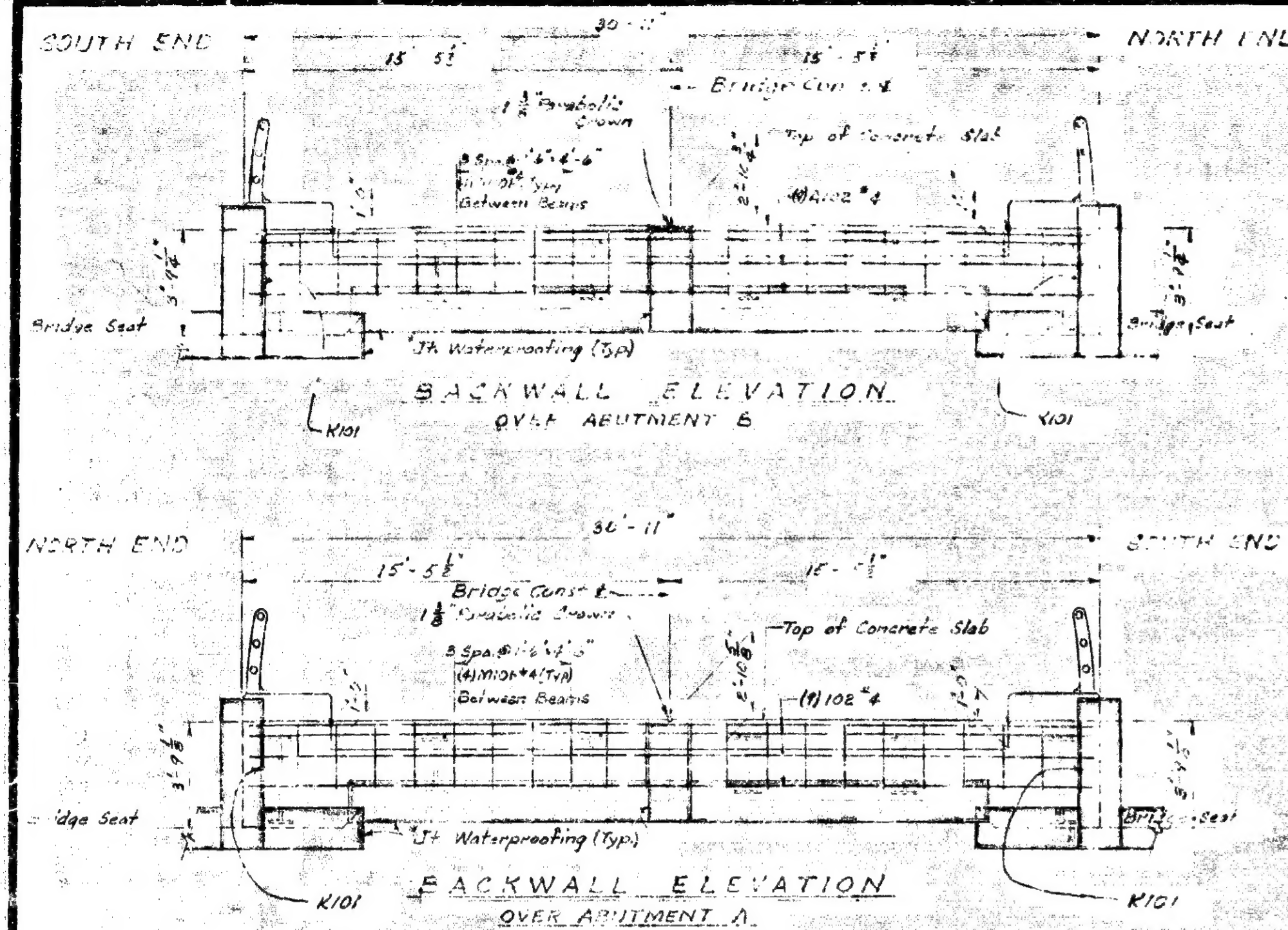
MICHIGAN STATE HIGHWAY DEPARTMENT  
 PIERS 1, 2, 3 DETAILS

DESIGNED BY: G. J. B. 10-25-60  
 CHECKED BY: J. P. D. 10-25-60  
 DRAWN BY: J. E. S. 10-25-60  
 DATE: 10-25-60  
 B4 OF 20-1-6







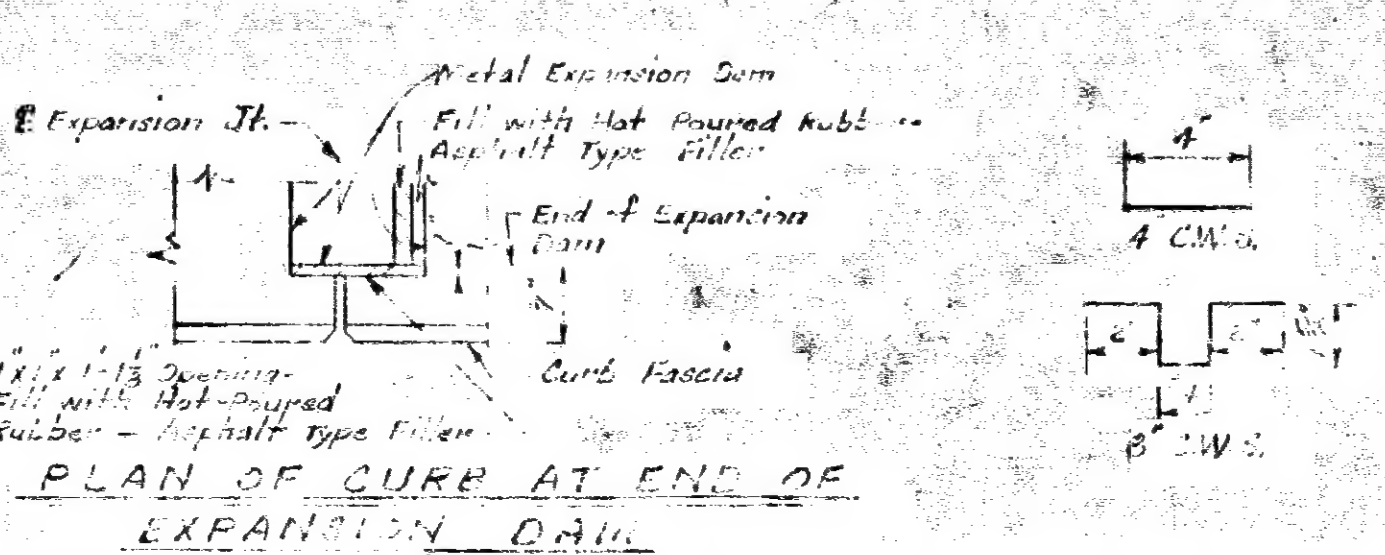
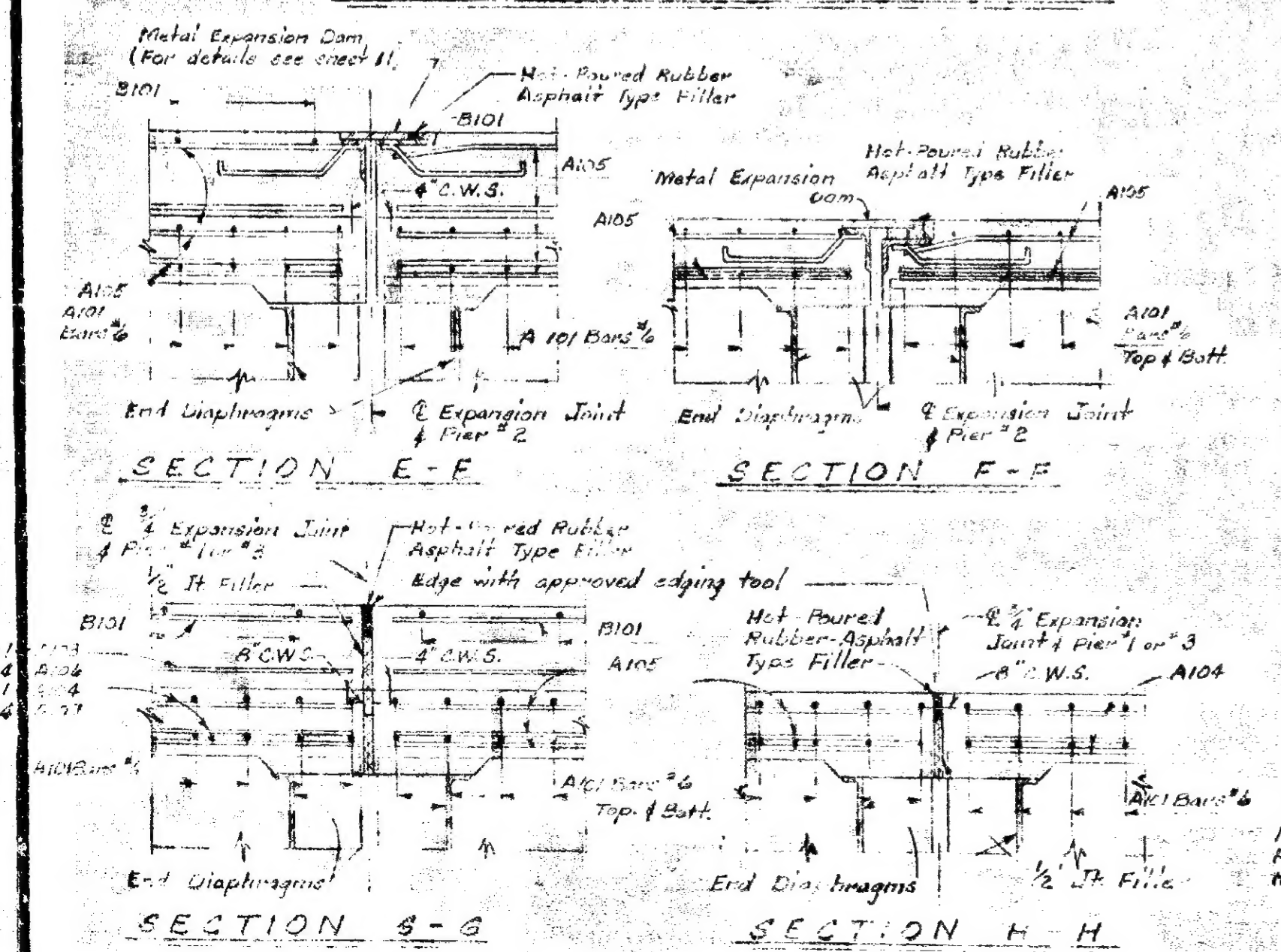
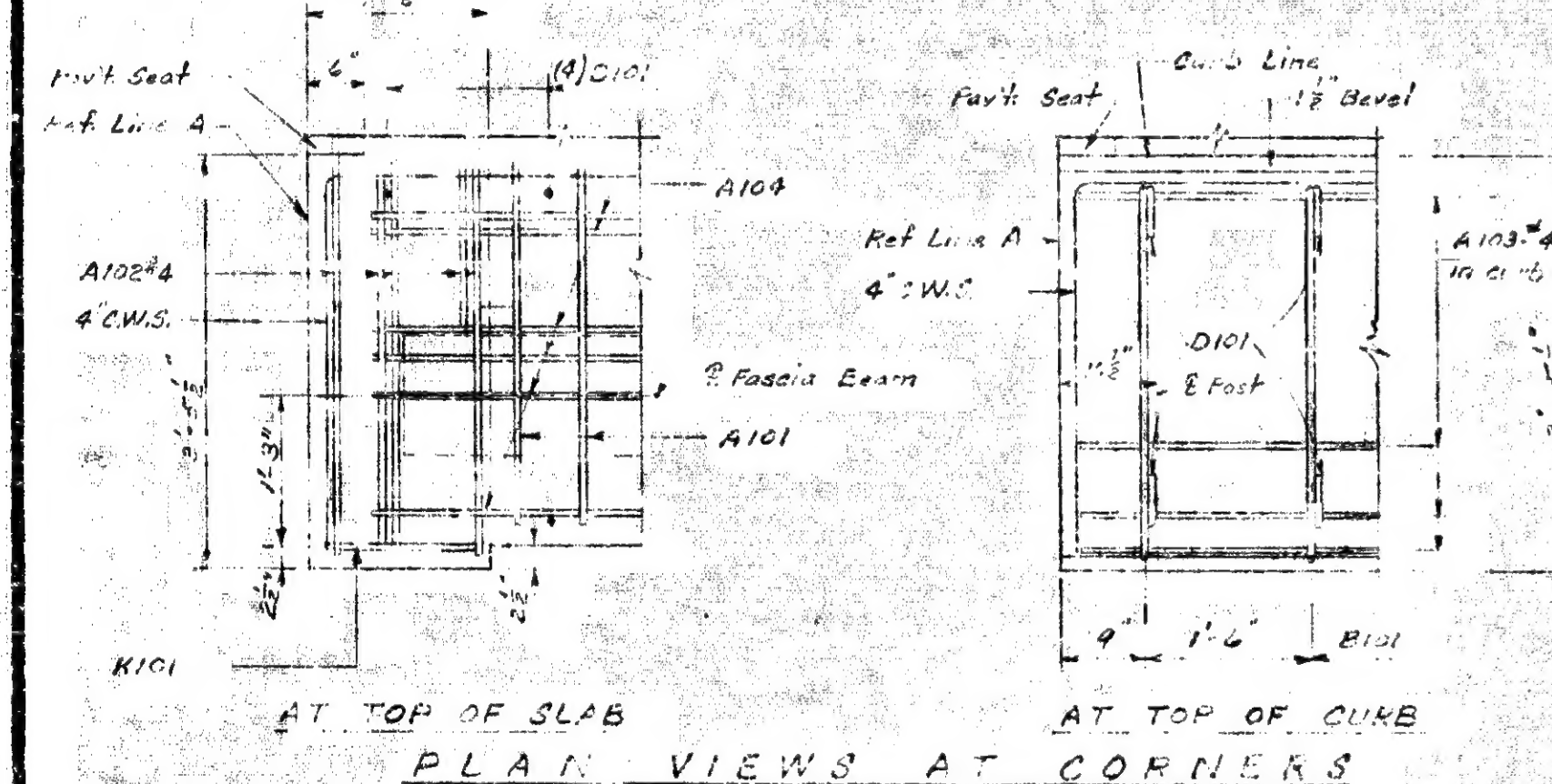


NOTES: Elevations shown are for top of screed before pouring any superstructure concrete and are based on a minimum slab thickness of 7". After screeds are set, if check indicates less than minimum slab thickness will be obtained, adjust screeds and expansion dams accordingly to provide the minimum required. The slab ordinates shown provide for dead load deflection, vertical curve, crown, and beam camber, and are to be measured from the top of the beam indicated (on a line parallel to the reference lines) to the top of the screed.

**SLAB THICKNESSES AND SCREED ELEVATIONS**

CONCRETE QUANTITIES GRADE A (6B)					
Location	Span 1	Span 2	Span 3	Span 4	Total
N. curb	4.4 cu. Yds.	9.5 cu. Yds.	9.5 cu. Yds.	4.7 cu. Yds.	28.1 cu. Yds.
Slab	14.4 "	29.8 "	29.8 "	15.2 "	89.2 "
S. curb	14.4 "	29.8 "	29.8 "	15.2 "	89.2 "
roadways	0.5 "	0 "	0 "	0.5 "	1.0 "
TOTAL					235.6 cu. Yds.

Notes: Sidewalk pours shall not be cast until slab concrete has attained at least 50% of its design strength as determined by the table in Section 5.01.03 of the Standard Specifications. These items are included in total quantities on Abutment Sheets.



Work this sheet with sheet #7

**MICHIGAN STATE HIGHWAY DEPARTMENT**

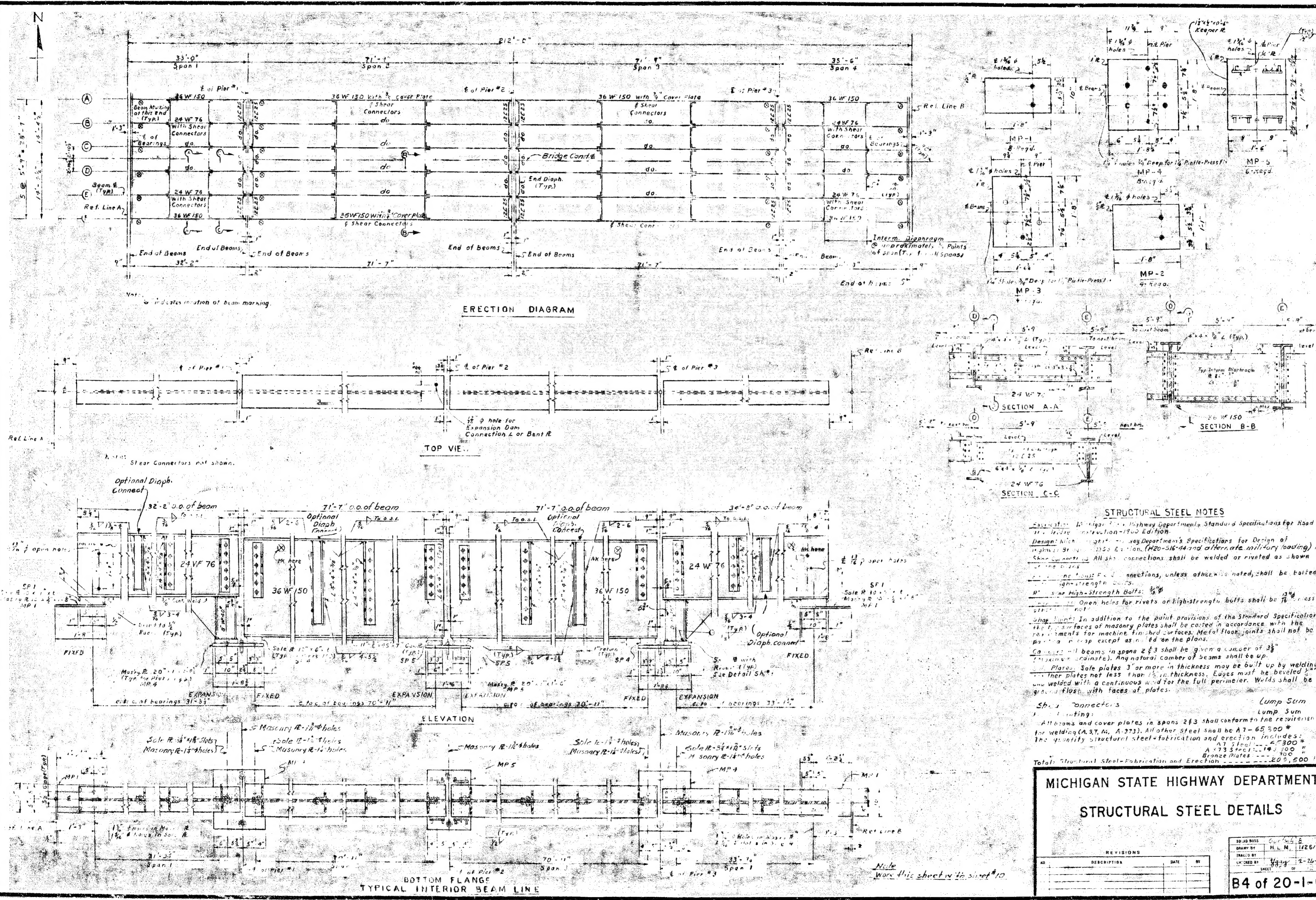
**SUPERSTRUCTURE DETAILS**

REVISIONS			
NO.	DESCRIPTION	DATE	BY

DRAWN BY: J.P. 1-15-60  
 CHECKED BY: P.D. 1-15-60  
 DESIGNED BY: P.D. 1-15-60  
 DATE: 1-15-60

**B4 OF 20-1-6**





**STRUCTURAL STEEL NOTES**

1. Fabrication shall conform to Michigan State Highway Department's Standard Specifications for Road and Bridge Construction - 1960 Edition.

2. Design shall conform to Michigan State Highway Department's Specifications for Design of Highway Structures - 1955 Edition, (M20-516-44 and other applicable military loading).

3. Connections shall be welded or riveted as shown on the plans.

4. All connections, unless otherwise noted, shall be bolted with high-strength bolts.

5. Open holes for rivets or high-strength bolts shall be 1/8" less than the hole diameter.

6. In addition to the provisions of the Standard Specifications, the surfaces of masonry plates shall be coated in accordance with the requirements for machine finished surfaces. Metal floor joints shall not be painted except as noted on the plans.

7. Cast-in-place concrete beams in spans 2 & 3 shall be given a camber of 3/8" (maximum ordinate). Any natural camber of beams shall be up.

8. Plates, steel plates 3" or more in thickness may be built up by welding other plates not less than 1/2" in thickness. Edges must be beveled and welded with a continuous weld for the full perimeter. Welds shall be ground flush with faces of plates.

**Steel Connectors**

**Lump Sum**

All beams and cover plates in spans 2 & 3 shall conform to the requirements for welding (A.37, M. A-373). All other steel shall be A7-65 500 #.

The quantity structural steel-fabrication and erection includes:

A7 Steel - 4,300 #

A735 Steel - 1,300 #

Brace Plates - 300 #

**Total: Structural Steel-Fabrication and Erection - 6,000 #**

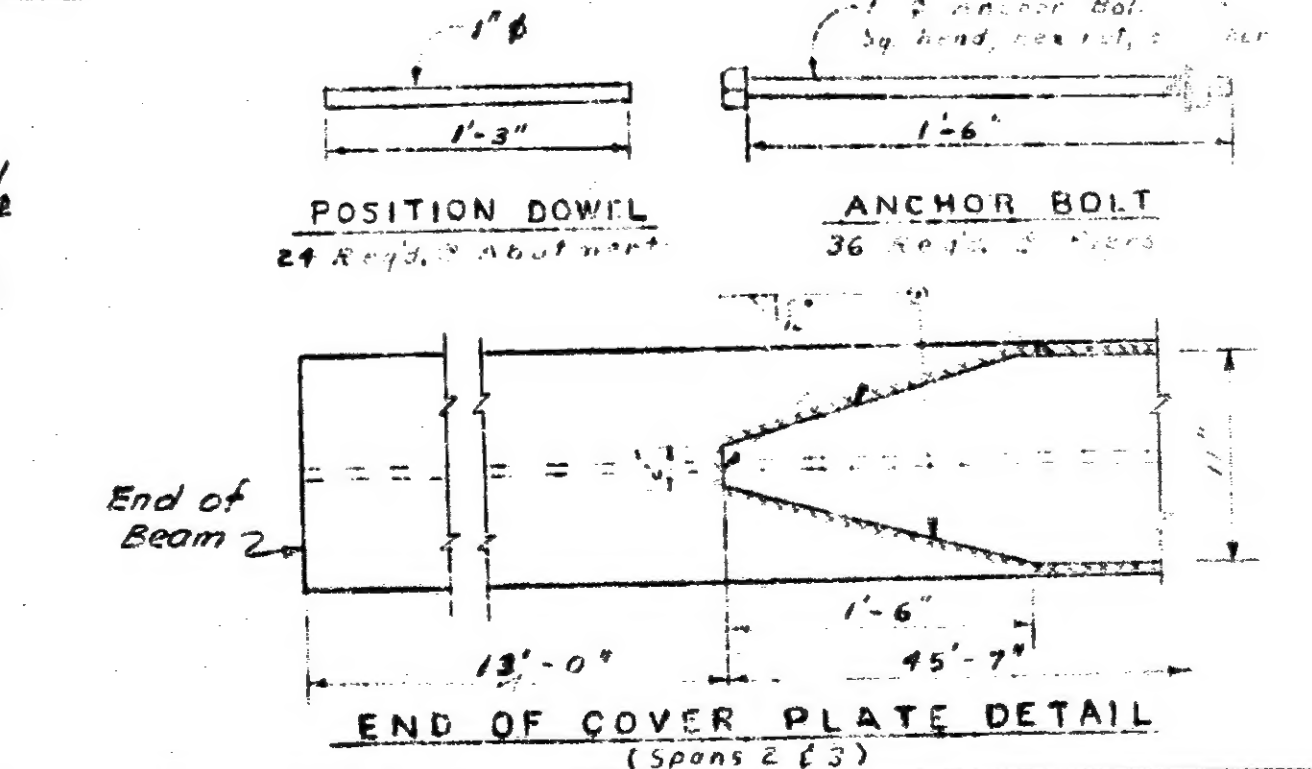
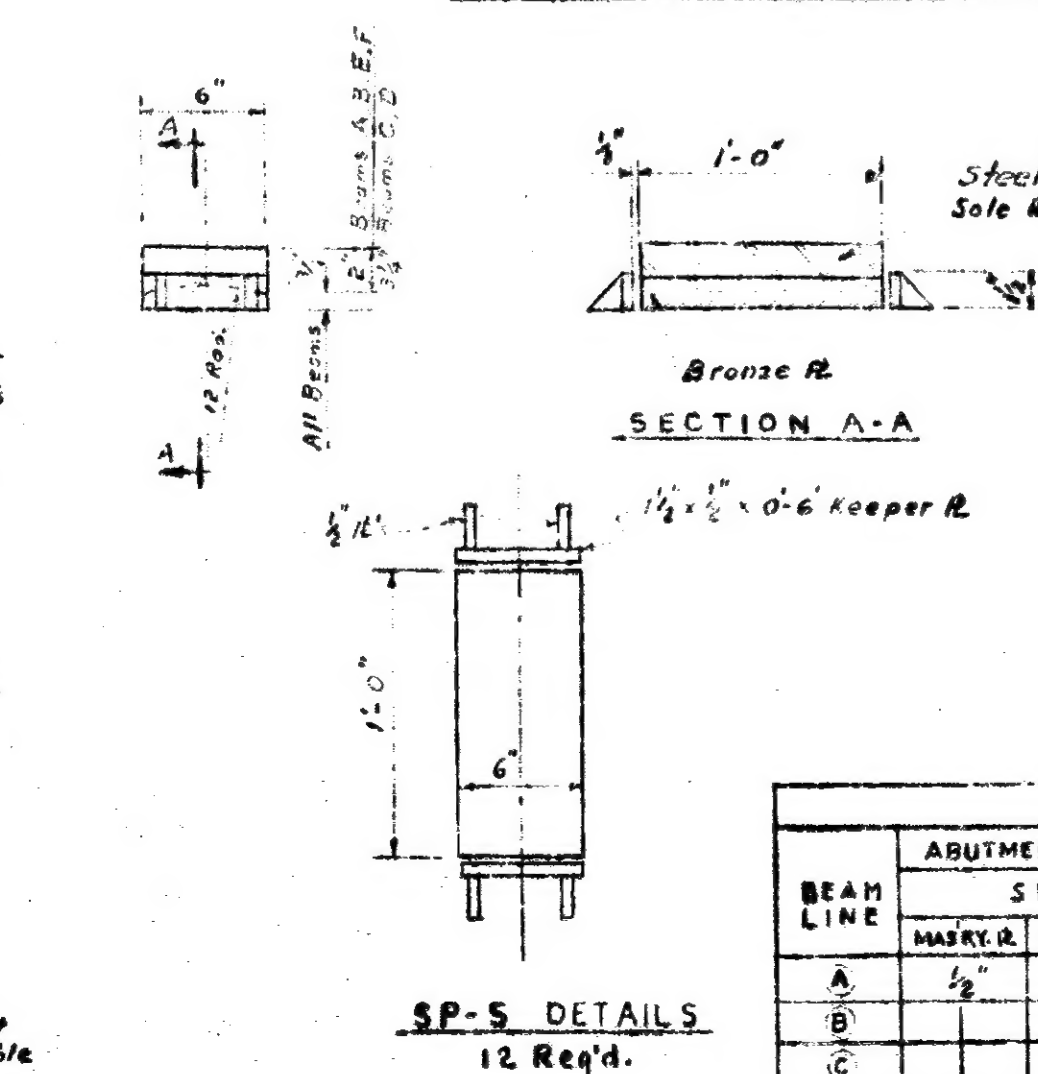
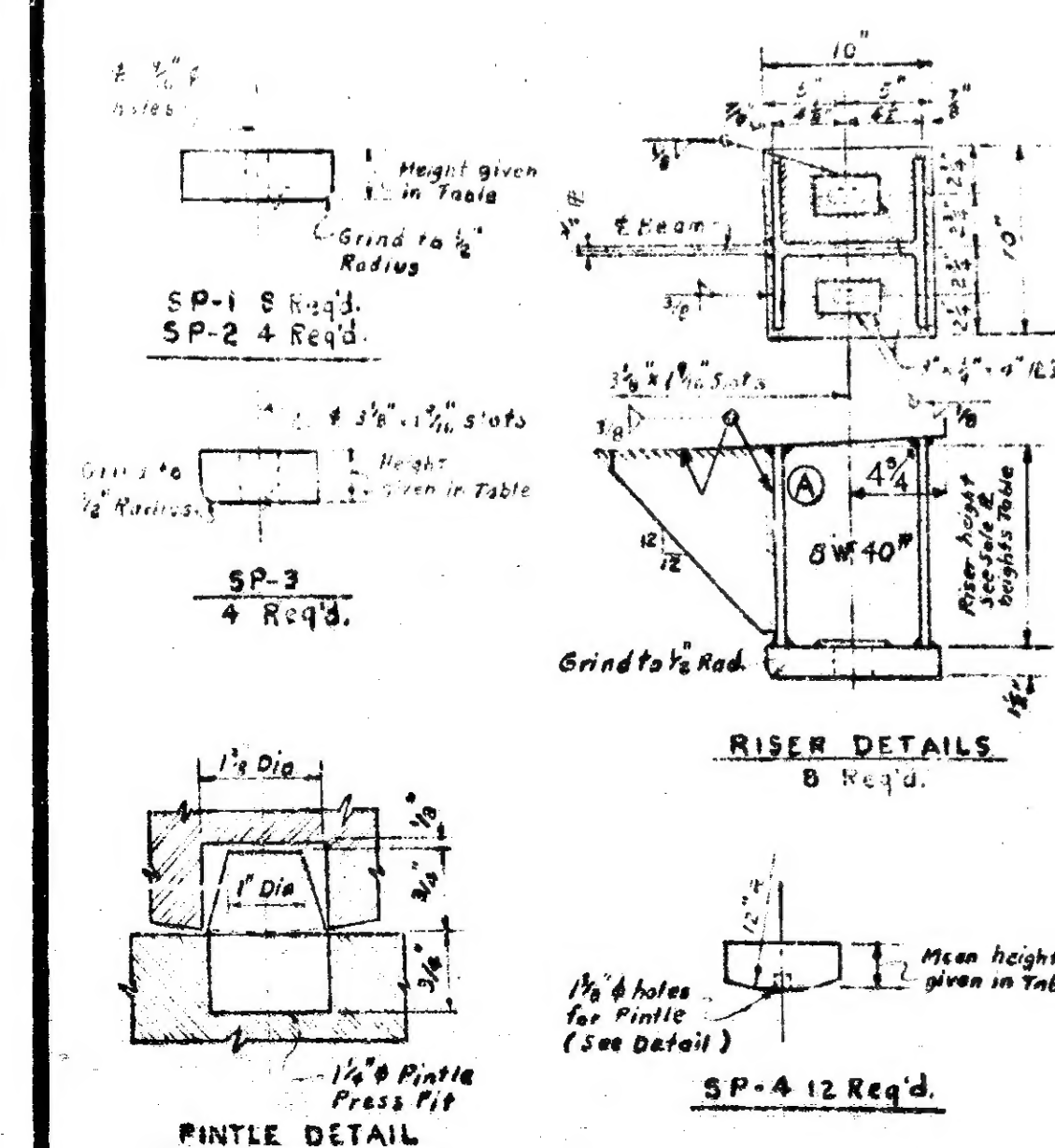
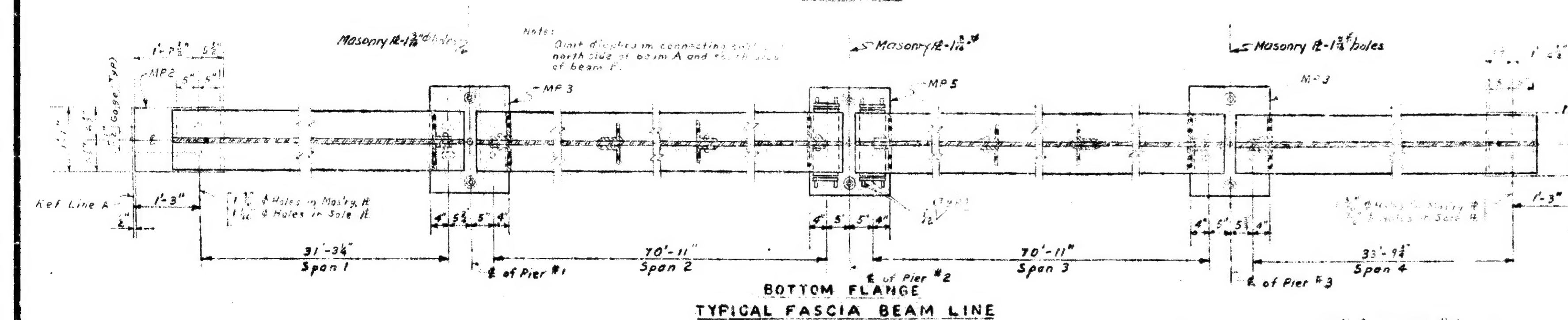
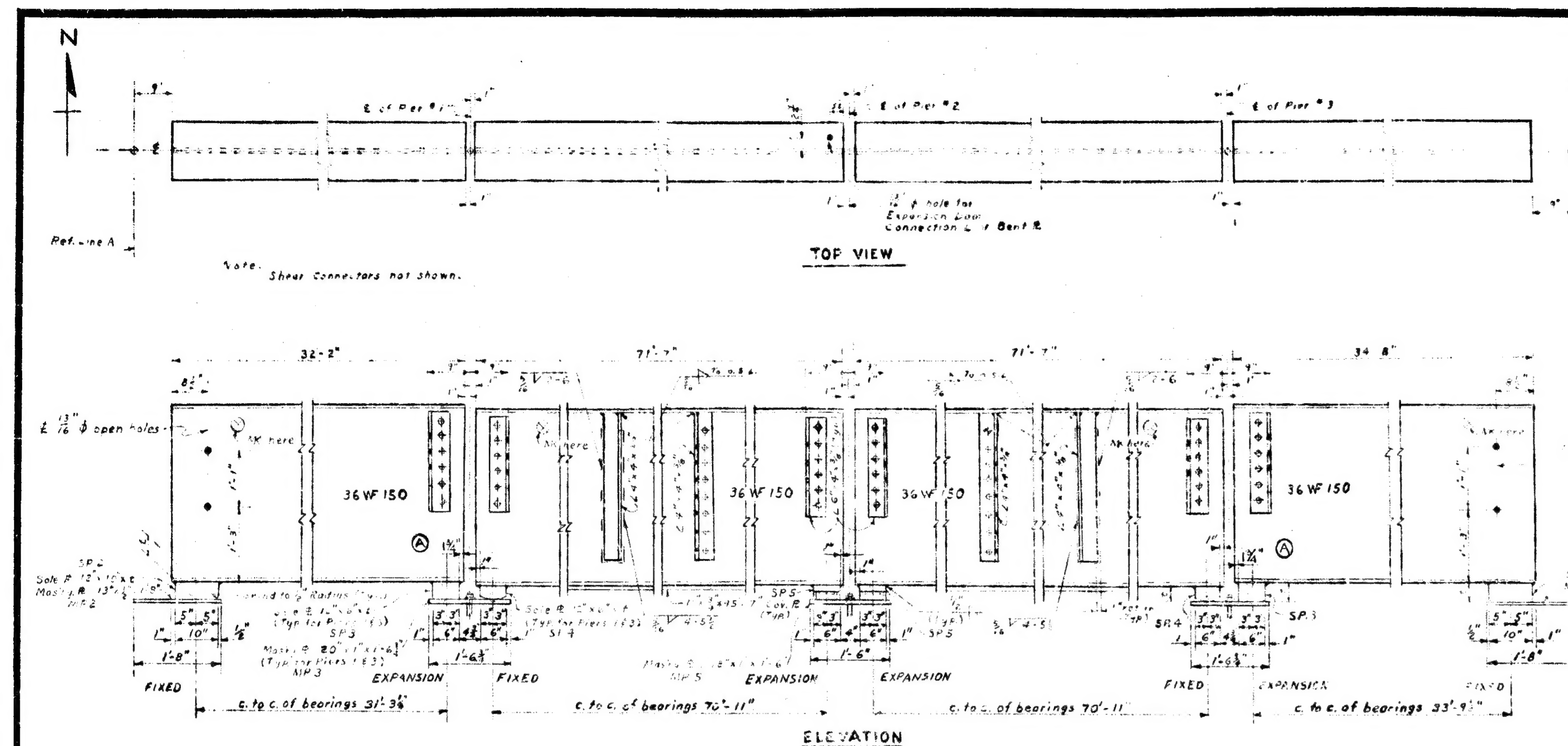
**MICHIGAN STATE HIGHWAY DEPARTMENT**

**STRUCTURAL STEEL DETAILS**

REVISIONS		DATE	BY
NO.	DESCRIPTION		

20-10-BSS  
DRAWN BY: M. L. M.  
CHECKED BY: M. L. M.  
DATE: 12/26/60  
SHEET: 12 OF 12  
B4 of 20-1-6

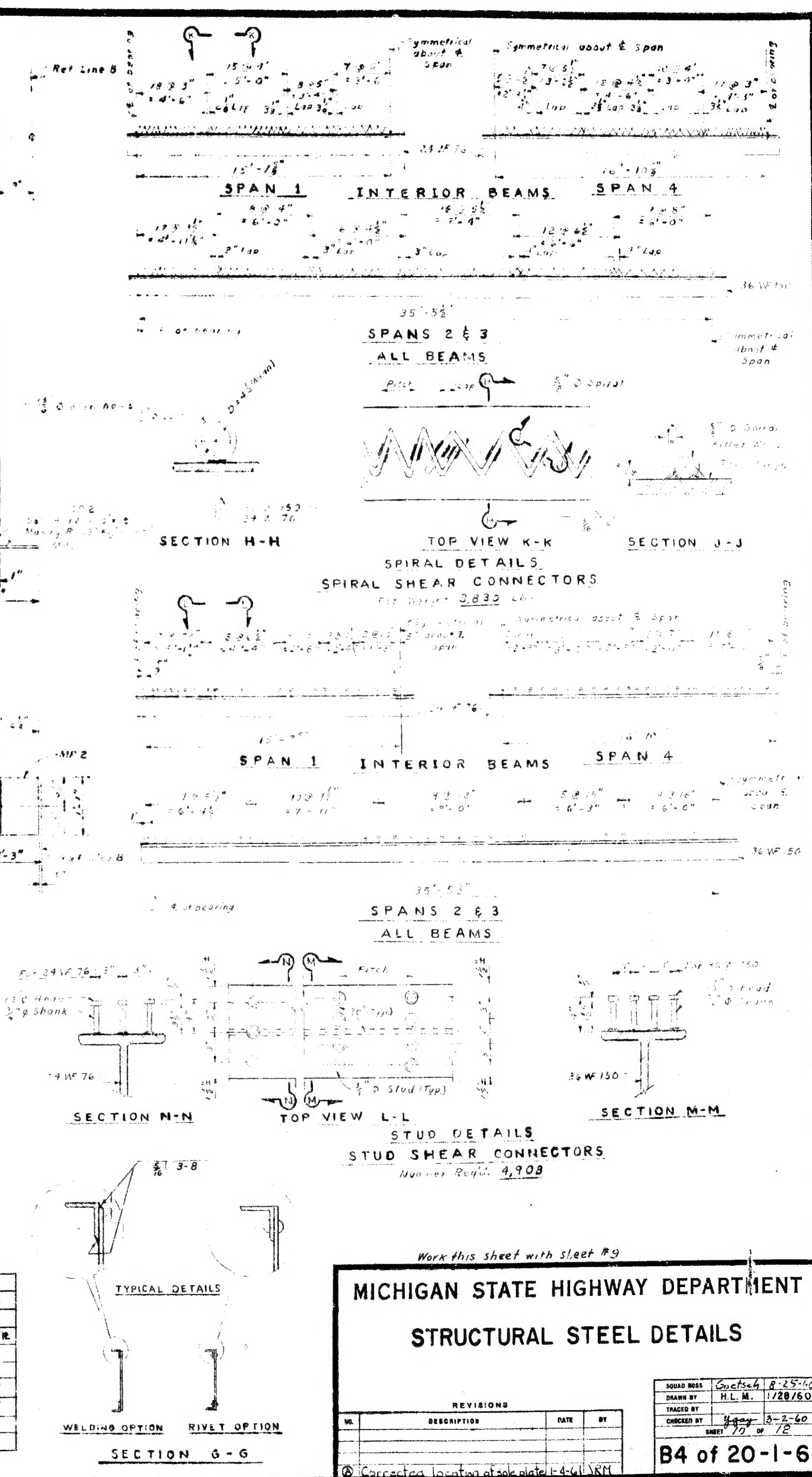




BEARING HEIGHTS IN INCHES														
BEAM LINE	ABUTMENT-A				PIER NO. 1		PIER NO. 2		PIER NO. 3		ABUTMENT B			
	SPAN 1		SPAN 2		SPAN 3		SPAN 4		SPAN 5		SPAN 6			
	MASRY R	SOLE R	SOLE R	MASRY R	SOLE R	SOLE R	MASRY R	SOLE R	SOLE R	MASRY R	SOLE R	MASRY R	SOLE R	
A	1/2"	2"	4"	1"	2 1/2"	2 1/2"	1"	2 1/2"	2 1/2"	1"	4"	1/2"	2"	
B	2"	1-2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	4"	4"	4"	1-2 1/2"	1"	2"	2"	
C	3 1/2"	1-3 1/2"	3 1/2"	3 1/2"	4"	4"	4"	4"	4"	1-3 1/2"	1"	3 1/2"	3 1/2"	
D	3 1/2"	1-3 1/2"	3 1/2"	3 1/2"	4"	4"	4"	4"	4"	1-3 1/2"	1"	3 1/2"	3 1/2"	
E	2"	1-2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	1-2 1/2"	1"	2"	2"	
F	2"	4"	2"	2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	4"	4"	4"	4"	

Riser Heights

⊕ Includes Bronze Bt.



Work this sheet with sheet 10

# MICHIGAN STATE HIGHWAY DEPARTMENT

## STRUCTURAL STEEL DETAILS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

SQUAD NO.	6063-64
DRAWN BY	H. L. M.
TRADES BY	444
CHECKED BY	3-2-60
SHEET	10 OF 12

B4 of 20-1-6



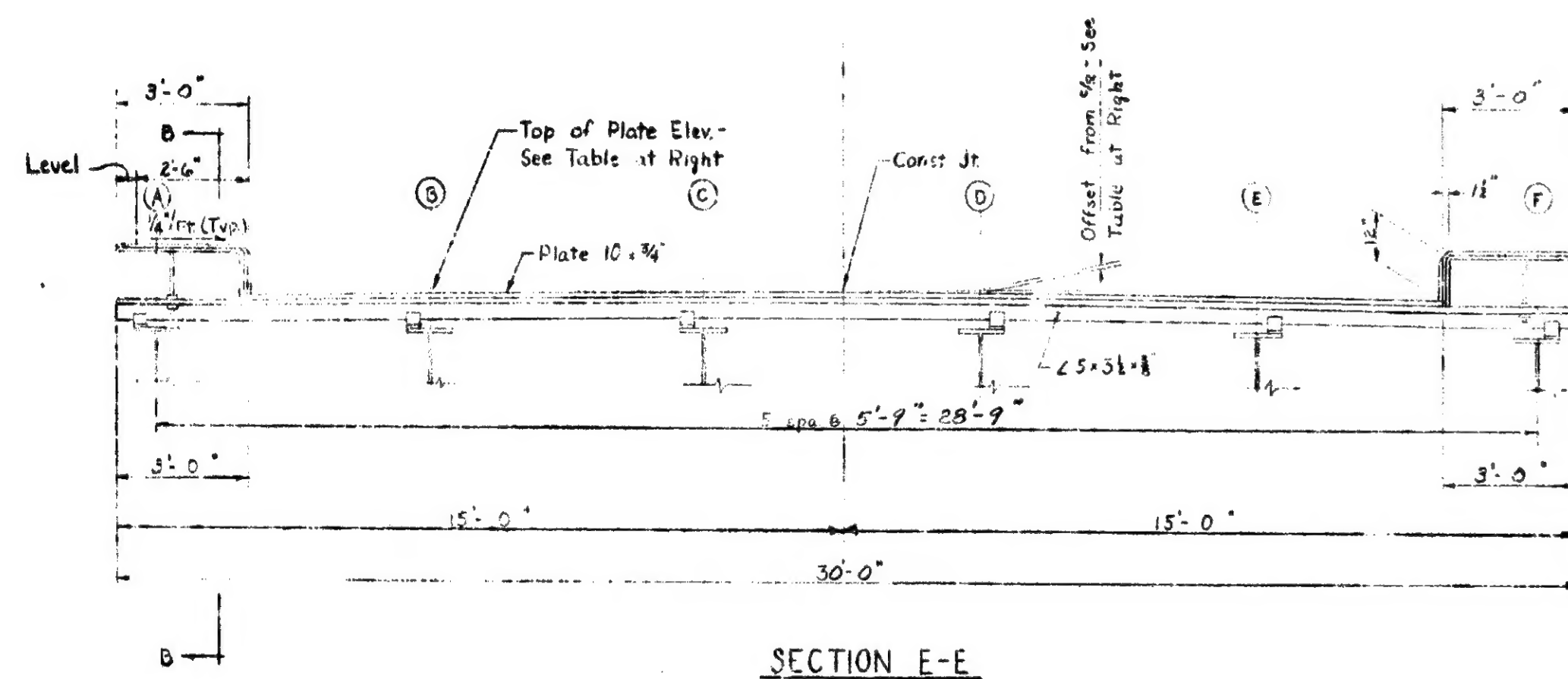
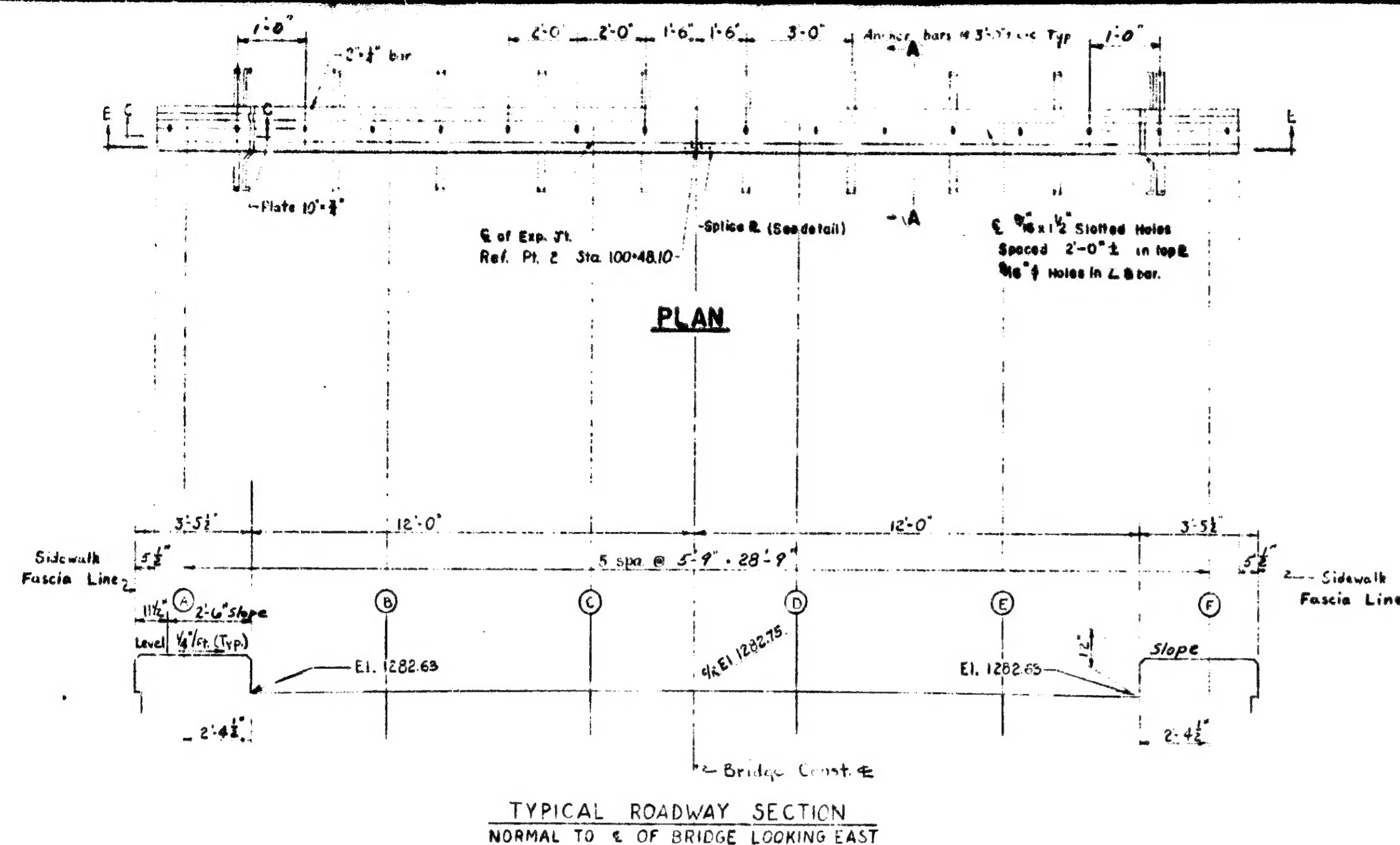
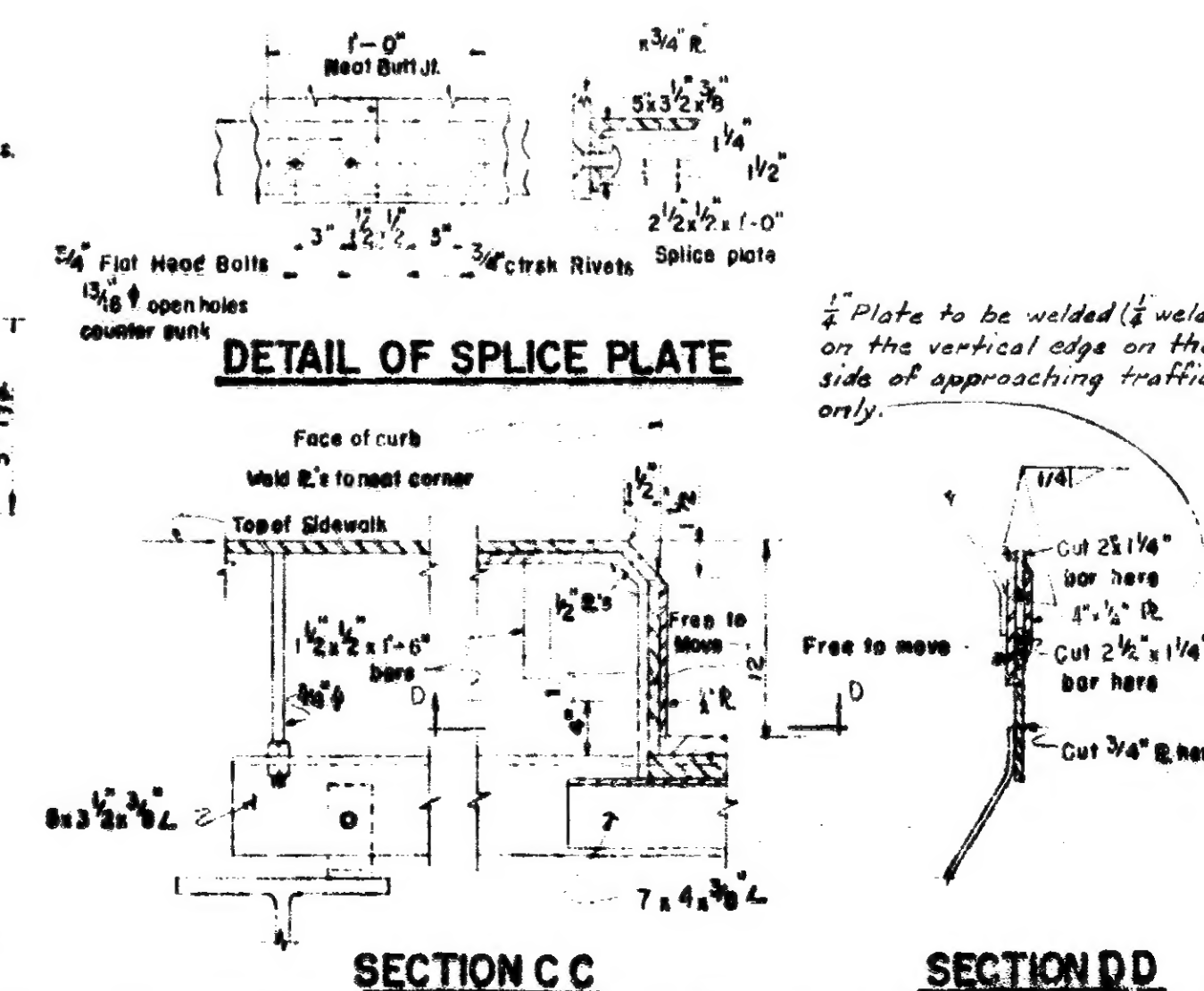
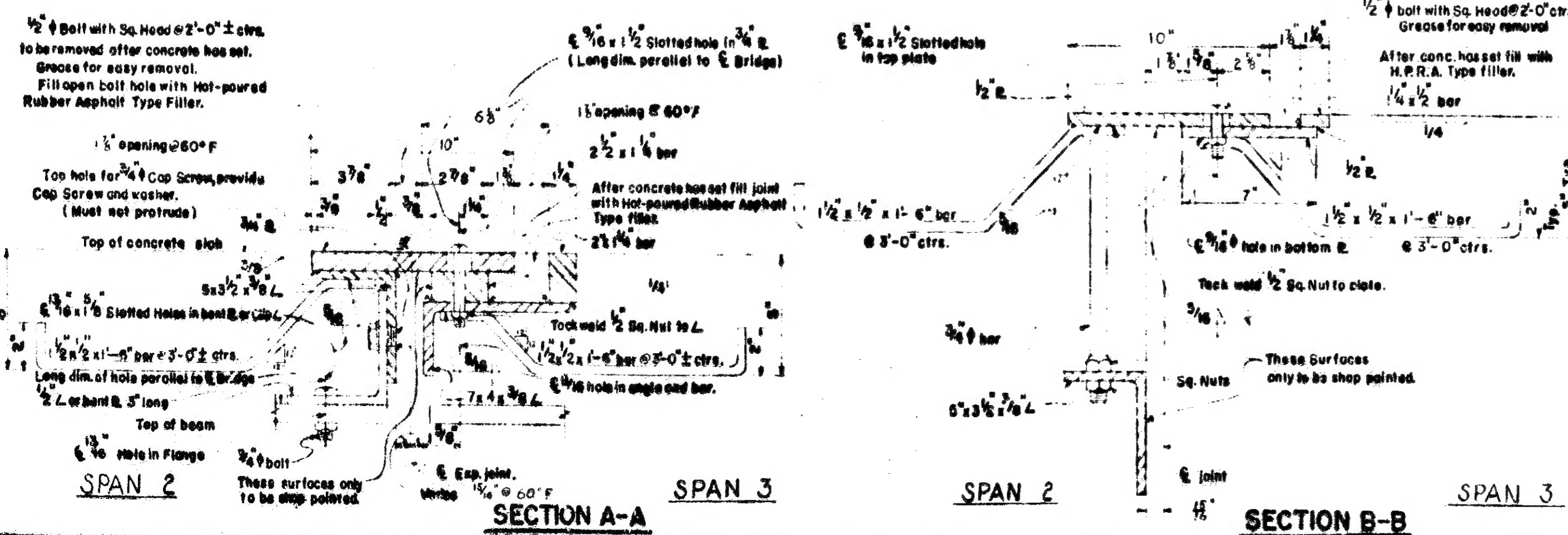


TABLE OF ELEVATIONS & DIMENSIONS			
Location @ Beam & Walk (A)	Elev. @ Top of Conc. & Plate	Vert. Offset from 5A	Elevation @ Top of Girder
WALK (A)	1282.63	-	1281.94
N. Gutter	1282.63	13"	-
(B)	1282.75	8"	1281.94
(C)	1282.74	7"	1282.04
E. Bridge @ 5A	1282.75	0	-
(D)	1282.74	8"	1282.04
(E)	1282.75	8"	1281.94
S. Gutter	1282.63	13"	-
Walk (F)	1282.63	-	1281.94



The expansion dam shall be bent in the shop to conform to the contour of the top of roadway slab.

# MICHIGAN STATE HIGHWAY DEPARTMENT EXPANSION DAM DETAILS







ITEM	UNIT	QUANTITY	DATE		PLAN EXTRAS			
			A	B	DATE	DESCRIPTION	UNIT	QUANTITY
			8-15-61	3-18-62			ESTIMATE	FINAL

MICHIGAN STATE HIGHWAY DEPARTMENT

### BILL OF MATERIAL

SEARCHED	Goetsch	8-25-60
DRAWN BY	Benson	8-24-60
TRACED BY		
CHECKED BY	WML	8-23-60
SHEET 4 OF 12		

**B4 OF 20-1-6**

Balanced by: ADM 4-11-62  
Checked by: H W G 4-12-62

502 of 30014 R